COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Tidewater Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

USA Waste of Virginia Landfills, Inc.
Bethel Landfill, Hampton, Virginia
Permit No. TRO - 61291

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, USA Waste of Virginia Landfills, Inc. has applied for a Title V Operating Permit for its Hampton facility. The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer / Permit Contact:_____ Date:_____

Air Permit Manager:_____ Date:_____

Regional Permit Manager:_____ Date:_____

FACILITY INFORMATION

Permittee

USA Waste of Virginia Landfills, Inc.
100 North Park Lane
Hampton, Virginia 23666

Facility

Bethel Landfill
0.1 mile west of Bethel Road, north of I-64
Hampton, Virginia 23669

Responsible Official

Mr. Robert Kania, Area Vice President
100 North Park Lane
Hampton, Virginia 23666

Facility Contact

Mr. Charles Plott
Site Manager
(757) 766-3033

ID No. 51-800-00121

SOURCE DESCRIPTION

The source is a municipal solid waste landfill located on a 392-acre parcel presently owned by the City of Hampton, Virginia. The facility is comprised of two operating areas, the Subtitle D disposal area and the old disposal area. The Subtitle D disposal area was permitted by the Virginia DEQ in accordance with Subtitle D of the federal Resource Conservation and Recovery Act (RCRA), federal regulations codified in 40 CFR, Part 258 and the Virginia Solid Waste Regulations. Solid Waste facility permits Nos. 521 and 580 remain in effect. The entire landfill is being operated and developed under SWF permit No. 580.

The total disposal acreage at the facility is 281 acres, of which 79 acres comprises the old disposal area and 202 acres comes under Subtitle D. The old disposal area, opened in 1987, has a liner of clay construction and now contains approximately 2.7 million tons of solid waste. Development of the Subtitle D disposal area is planned in 12 phases with current activity being devoted to Phase I, which began in 1996. The permittee/operator is authorized to accept municipal solid waste (MSW), construction and demolition debris (CDD), MSW incinerator ash and nonhazardous industrial waste. The landfill

design calls for a planned daily disposal rate of 2000 tons with the final facility volume of over 49 million cubic yards over a life of 47 years.

The principal waste stream that the facility has received for disposal in the past and will continue to receive for disposal in the future is MSW, a putrescible waste. The placement and aging of the MSW in the landfill begins to generate landfill gas shortly after accepting the waste for disposal. Through a natural anaerobic process, the various organic materials in the MSW begin to breakdown due to microbial attack and the yield is primarily methane and carbon dioxide with various intermediate organics present in trace amounts. After several years of operation, the landfill gas has purged much of the oxygen and nitrogen from the hill and the gas now consists of nearly equal parts of CH_4 and CO_2 with some N_2 and about 1% of trace organics that makeup the Non-methane part (NMOC). Current regulations that require landfill operators to control the migration of the methane gas from the hill leads to the installation of gas control systems (GCCS). The GCCS consists of locating and sinking gas wells in the landfill and connecting these with headers to permit efficient collection of the landfill gas. The landfill gas is disposed of by combustion using a candle flare in the early life of the facility while the flow of the gas is low and slowly increasing. As more MSW is placed in the landfill and the years go by, gas flow reaches a level where the candle flare's capacity is exceeded and an enclosed-type flare is needed. To provide a steady flow of the gas under near constant pressure to the combustion devices, a large blower must be installed in the collection system. The blower places a slight negative pressure on the wellheads and the interior of the landfill in order to limit the possibility of exceeding the surface methane limit of 500 ppm. In the process of collecting the landfill gas under the negative pressure, some nitrogen is pulled into the landfill from the surface air. Since the nitrogen will reduce the heat content of the gas as its portion is increased, the operator monitors the nitrogen content at the wellheads to optimize the collection parameters.

The Bethel landfill installed their GCCS with the candle flare in a 1996 permit. After that construction, a 1997 application for an amendment to their permit to install and construct an enclosed flare as the primary control device was processed. Recordkeeping for the GCCS was begun during January of 1997. Also, the request included the installation of energy recovery equipment which was a 95KW engine / generator and a 4.2 mmBtu / hour leachate vaporator. The State Operating Permit was updated and amended as necessary to correct some conditions and to delete other requirements that had been superseded.

Emission Units
The emission units at the landfill include the flares, the engine generator and the vaporator. The emissions units at the landfill are considered to be new units under Virginia Regulations and are regulated by Virginia's New / Modified Stationary Source Rules and the NSPS, Subpart WWW. Primary emissions POCs (all of the combustion equipment) and the Non-methane Organic Compounds (NMOC's). Those emissions units that have been assigned permit limits are P001, P001A, B001 and F001. However, two tanks; P003 and P009 have been indicated as subject to Subpart Kb, under the recordkeeping provisions primarily because their size is greater than 10,000 gallons.

The landfill includes some processes that are deemed insignificant, such as the fluid storage tanks and an emergency generator.

Emission Unit Description
The candle flare used as a backup control device is a model No. 1.5x22 Tornado Flare Systems, built in 1972 and has a maximum LFG flow rate of 3000 scfm at 30 mmBtu per hour. A larger enclosed flare designed for maximum destruction of VOC's and NMOC's is the primary control device for the landfill gas. The enclosed flare is a Tornado Flare Systems model EV-4250, designed for a maximum flow rate of 4250 cfm of LFG. An engine / generator by Waukesha, rated at 95KW / 135 HP is operated on LFG to provide minimum power for the landfill operations. A vaporator / boiler is used to reduce the volume of leachate from the landfill during future operations and also operates on LFG fuel. Subpart WWW requirements for the enclosed flare dictates a 98 percent destruction efficiency for the NMOC component of the LFG and / or a maximum concentration of 20 ppm of NMOC's in the flue gas.

COMPLIANCE STATUS

The facility is believed to be in compliance with a State Operating permit issued, October 29, 1996 and modified June 13, 1997 and amended May 16, 2000 and July 17, 2001 for the MSW landfill and the gas collection and control system. In addition, the source is believed to be in compliance with the NSPS at 40 CFR 60, Subpart WWW for the operation of MSW landfills.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

P001	The enclosed flare
P001A	Candle flare
F001	LFG-fueled Engine / Generator
B001	LFG-fueled Vaporator
P009	Leachate Storage Tank
P003	Diesel Fuel Storage Tank

EMISSIONS INVENTORY

Actual emission estimates for 1999 were provided by USA Waste of Virginia Landfills, as part of the application for the updated State Operating permit. Emission levels are expected to increase over time as the landfill grows the waste in place.

1999 Actual Emissions

	1999 Criteria Pollutant Emissions in Tons / Year				
Emission Unit	VOC	CO	SO_2	PM_{10}	NO_x
Landfill Operations	2.75 Tons (as NMOC)	N / A	N / A	N / A	N / A
Combustion Equipment	3.43	10.49	2.33	0.0	5.59
Total	6.18	10.49	2.33	0.0	5.59

1999 Facility Hazardous Air Pollutant Emissions

Pollutant	1999 Hazardous Air Pollutant Emissions in Tons / Yr
N / A	HAP's exist only in trace amounts (see application)

EMISSION UNIT APPLICABLE REQUIREMENTS - [emission units P001, P001A, B001 and F001]

Limitations

The Bethel Landfill has been permitted under the State Operating Permit program since October 29, 1996, with subsequent amendments issued June 13, 1997, May 16, 2000 and July 17, 2001. At present, Bethel Landfill retains all of the LFG on-site and flares most of the gas that is not needed for a generator and vaporator. The enclosed flare, the engine and the vaporator are subject to the provisions of the NSPS, Subpart WWW and any Virginia Administrative Codes that have specific emission requirements. The current understanding for facilities that operate landfills subject to the NSPS requires that the landfill owner or operator be responsible for ensuring that all combustion devices meet NSPS requirements.

< 9 VAC 5-50-80 "New / Modified source standard for Visible Emissions" – units may not emit greater than 20% opacity except for one six-minute period in any one hour of not more than 30% opacity (reference 40 CFR 60, Appendix A. Method 9).

< 9 VAC 5-50-20 "Facility and Control Equipment Maintenance or Malfunction" – at all times, the facility, including associated air pollution control equipment, must be maintained and operated in a manner consistent with air pollution control practices for minimizing emissions.

Periodic Monitoring

The monitoring and recordkeeping requirements listed in this permit have been drafted to meet Part 70 requirements and those contained in the 40 CFR 60.756. The estimated emissions from this landfill operation were calculated from the 'Landfill Gas Emission Model', accumulated amount of waste in-place, the flow and analysis of the LFG and the default emission factors from the AP-42, Section 2.4. Assumptions and default values that were prominent in these calculations are as follows:

< Facility emissions are based on the assumption that any efficient LFG collection system has a maximum capture of 75% on the landfill.

< The VOC emissions assumed a default value equal to 39% of the generated NMOC content of the landfill gas flow that is calculated or found by stack test results.

Calculation Demonstration

No periodic monitoring for the emission limits for criteria pollutants is required in the permit. The following demonstration is provided to show that there is not a great likelihood that the emission limits will be exceeded:

Given:Flare capacity at maximum heat input = approximately 130 mmBtu per hour
Maximum LFG flow rate = 4250 scfm (based on year 2042 maximum projected)
Assumed LFG collection efficiency = 75% (AP-42 discussion and guidance)
Results of the Initial Performance Test of the LFG Collection and Control System:
Emission Factor Derivation: Stack test of June 27-28, 1997:

NMOC	=	0.044 lbs / mmBtu
CO	=	0.020 lbs / mmBtu
NO_x	=	0.100 lbs / mmBtu
SO_2	=	0.019 lbs / mmBtu

Adjustment of the 'k' value based on the performance testing. A discrepancy between the calculated and the measured LFG flow rates indicated that an adjustment was necessary for many of the assumed constants used in the subject equations. Therefore the 'k' value was adjusted upward from 0.02 to 0.04 for all future projections of gas flow rates and resulting emission rates. Initial projections of the 1997 LFG flow rate resulted in a value of 49,000 cfh, but measurements showed a value of 60,000 cfh in early 1997. Adjusted calculations gives a value of 65,288 cfh for the 1997 projected flow rate. This more accurately replicates existing conditions for 1997, at the source. This adjustment in the landfill conditions also highlights an increase in the projected maximum methane generation rate of about 35% over the projected rate listed in the 1996 permit application.

Adjustment of the maximum projected LFG flow rate will be necessary in future permit applications due to the increasing size of the landfill waste in place. The new projection for the maximum flow rate will be more than the current estimate of 2.32 billion cubic feet per year (based on planned operations in year 2042). Plans for Bethel call for a revision to the State Operating Permit in late 2003 or early 2004.

Adjustment of the C_{NMOC} Value based on initial performance testing. Default calculations resulted in inflated values for the NMOC concentration equal to 4000 ppm. Measured VOC concentration was found to be 2400 to 2600 ppm and based on an 80% factor for VOC components in the NMOC, the C_{NMOC} value becomes approximately 3000 ppm.

Not withstanding the obvious errors of the default calculations utilized in the State Operating Permit Application prepared during 1996, those original calculations have had to be adjusted. Stack test results and default calculations show that the k value and the C_{NMOC} value changes require new calculations.

Landfill gas routed to the flares, engine and vaporator is limited by a State Operating Permit, dated July, 2001, where the maximum expected annual throughput of landfill gas is the amount of 2.32 billion cubic feet.

The calculation estimate is based on the maximum expected flow rate for the next five-year period and compared to the permit limits. Current routing of the gas is to send the amount necessary for the vaporator and operation of the engine, with the remaining going to the enclosed flare. The candle flare may be used intermittently, as needed to compensate for down time of the other combustion equipment. To simplify the demonstration, it is assumed that all of the gas is consumed by the primary flare.

An estimate calculation of the expected annual gas flow over the next five year period in which the Title V permit will be effective is as follows:

The baseline gas flow was established during the stack test of 1997 at 65,000 ft^3 / hour
The maximum expected gas flow during the year 2042 is 359,000 ft^3 / hour.
Projecting forward to the year 2008 gives a maximum gas flow rate of about 135,000 ft^3 / hr. Using this max expected number; the calculations will show that the current permit limits would not be exceeded during the term of this permit.

NMOC = 1.35 x 10^5 cfh (500 Btu / ft^3 x 0.044# / 10^6 Btu = **2.97 lbs-NMOC/hour**
= (2.97) x 8760 / 2000 **= 13.01 Tons-NMOC per yr.**
Total facility NMOC emissions = **2.75 + 13.01 = 15.76 Tons –NMOC per Year**
The TITLE V permitted rate is **18.7 tons-NMOC/year**

SO2 = 1.35 x 10^5 cfh (500 Btu / ft^3 x 0.019# / 10^6 Btu = **1.2825 lbs-SO2/hour**
= (1.2825) x 8760 / 2000 **= 5.62 Tons-SO2 per year**
The TITLE V permitted rate is **15.6 tons-SO2/year**

NOx = 1.35 x 10^5 cfh (500 Btu / ft^3 x 0.1# / 10^6 Btu = = **6.75 lbs-NOx/hour**
= (6.75) x 8760 / 2000 **= 29.57 Tons-NOx per year**
The TITLE V permitted rate is **61.4 tons-NOx/year**

CO = 1.35 x 10^5 cfh (500 Btu / ft^3 x 0.020# / 10^6 Btu = = **1.35 lbs-CO/hour**
= (1.35) x 8760 / 2000 **= 5.91 Tons-CO per year**
The TITLE V permitted rate is **97.8 tons-CO/year**

Based on the demonstration, it appears there is not a great likelihood that the emission limits will be exceeded, and no additional periodic monitoring other than opacity has been required for this facility.

Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the regulations. These records include the annual throughput of landfill gas, control efficiency tests of the control equipment, the annual placement of MSW in the landfill and all monitoring information for the GCCS, flares and other combustion devices. These specific requirements are listed in 40 CFR 60.758

Testing

An annual test will be performed to determine the actual destruction efficiency of the control equipment for NMOC. Reference 40 CFR 60.752, which specifies the initial performance, test and in accordance with Section 60.754(d) which describes the test method.

Reporting

All reports required by Subpart WWW (Section 60.755) shall be prepared and submitted to the Tidewater Regional Office in accordance with procedures outlined in Subpart WWW (Section 60.757).

Streamlined Requirements

The permit does not contain any streamlining of permit requirements.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upset, within one business day.

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.1-20.01:2 and '10.1-1185 of the *Code of Virginia,* and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general condition cites the entire Article(s) that follow:
B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources
B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:
B. 9 VAC 5-80-80. "Application"
B.2. 9 VAC 5-80-150. "Action on Permit Applications"
B.3. 9 VAC 5-80-80. "Application"
B.4. 9 VAC 5-80-80. "Application"
B.4. 9 VAC 5-80-140. "Permit Shield"
B.5. 9 VAC 5-80-80. "Application"

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emissions reporting within 4 hours. Section 9 VAC 5-80-250 also requires malfunction reporting; however, reporting is required within 2 days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to this section including Title 5 facilities. Section 9 VAC 5-80-250 is from the Title 5 regulations. Title 5 facilities are subject to both Sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within 4 day time business hours of the malfunction.

In order for emission units to be relieved from the requirement to make a written report in 14 days, the emission units must have continuous monitors and the continuous monitors must meet the requirements of 9 VAC 5-50-410 or 9 VAC 5-40-41.

This general condition cites the sections that follow:

F. 9 VAC 5-40-50. Notification, Records and Reporting
F. 9 VAC 5-50-50. Notification, Records and Reporting
F.1. 9 VAC 5-40-50. Notification, Records and Reporting
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F.2. 9 VAC 5-40-50. Notification, Records and Reporting
F.2. 9 VAC 5-50-50. Notification, Records and Reporting
F.3. 9 VAC 5-40-50. Notification, Records and Reporting
F.3. 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources
F.3.a. 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources

This general condition contains a citation from the Code of Federal Regulations as follows:
F.2.a. 40 CFR 60.13 (h). Monitoring Requirements.

U. Failure/Malfunction Reporting

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in section 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation, see the comments on general condition F.

This general condition cites the sections that follow:

U.2.d. 9 VAC 5-80-110. Permit Content
U.2.d. 9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

STATE ONLY APPLICABLE REQUIREMENTS

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have been identified as applicable by the applicant:

9 VAC 5 Chapter 50, Part II, Article 2: Standards of Performance for Odorous Emissions (Rule 5-2)

9 VAC 5 Chapter 50, Part II, Article 3: Standards of Performance for Toxic Pollutants (Rule 5-3)

FUTURE APPLICABLE REQUIREMENTS

The facility is subject to the NESHAP for Municipal Solid Waste Landfills and will be required to be in compliance with the additional requirements by January 16, 2004 under the MACT definition of an existing source. A section for 'Future Applicable Requirements' will be inserted in this Title V permit. All applicable requirements for NSPS WWW landfills are contained in the permit at this time. However, it must be recognized that amendments have been proposed to this Subpart and that the future promulgation of these amendments to the regulation may impact this operating permit.

INAPPLICABLE REQUIREMENTS

The facility has not identified any inapplicable requirements in their permit application.

COMPLIANCE PLAN

The source does not have the requirement of a compliance plan.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation[1] (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
P004	Gasoline Storage Tank	5-80-720 B	VOC	220 gallons

Emission Unit No.	Emission Unit Description	Citation[1] (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
P005	Crankcase Oil Storage Tank	5-80-720 B	VOC	500 gallons
P006	Hydraulic Fluid Storage Tank	5-80-720 B	VOC	500 gallons
P007	Trans Fluid Storage Tank	5-80-720 B	VOC	500 gallons
F003	Diesel Emerg. Generator	5-80-720 C	CO, VOC, NOx, SO2 and PM10	500 Watts
F004	Gasoline Emerg. Generator	5-80-720 C	NOx, CO, SO2, PM10, VOC	0.67 HP

[1]The citation criteria for insignificant activities are as follows:
9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit will be placed on public notice in the Virginian Pilot from March 13, 2003 to April 12, 2003 .